



UNITED STATES DEPARTMENT OF COMMERCE
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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/530,661	09/20/95	KEETH	B MI22-356

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EXAMINER	
KELLEY, N	
ART UNIT	PAPER NUMBER
2503	10

03/19/97

DATE MAILED:

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☒ Responsive to communication filed on 1/22/97 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice of Draftsman's Patent Drawing Review, PTO-948. |
| 3. <input checked="" type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-27 are pending in the application.
Of the above, claims 1-5, 11-17, 20-21, 24 and 27 are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 6-10, 18-19, 22-23, and 25-26 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____ Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____, has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

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Claims 1-27 are pending in this application.

Applicant's election of claims 6-10, 18-19, 22-23 and 25-26 in Paper No. 9 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 6-10, 18-19, 22-23, and 25-26 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The improved structure is claimed with respect to overall memory size and device density. The disclosure is in terms of various improvements which make possible the production of applicant's claimed structure. Use of one or more of these improvements is thus critical or essential to the practice of the invention. Since these improvements are not included in the claim(s), the claimed structure is not enabled by the disclosure. In re Mayhew, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Specifically, applicant discloses techniques to reduce the size of bird's beaks, to increase capacitance, to improve mask alignment, to eliminate field oxide regions, etc. Applicant discloses that the use of one or more of these techniques is necessary to achieve the claimed device density. Since it is the use of these very techniques which results in applicant's ability

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to produce the claimed structure, applicant's claims must include the structural features of the improved techniques. Such features might be the size of the bird's beak, the capacitance of cells, the irregular surface of the capacitor electrodes, etc. Since the presence of these features is essential to existence of applicant's structure, these features (or others) must be claimed in order for the claimed structure to be enabled.

Claims 7, 9, and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7, 9, and 10 each recite "composite conductive line layers." The phrase "composite" is vague and indefinite because it is not clear exactly what structure this phrase is meant to embrace.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject

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matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-10, 18-19, 22-23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's discussion of the prior art in view of Denboer ("Inside Today's Leading Edge Microprocessors," Semiconductor International, 2/1994).

In applicant's "BACKGROUND OF THE INVENTION," applicant discloses that 16M DRAM chips exist in the prior art (page 2, line 15), that DRAM chips are normally made with cells arranged in multiple repeating memory arrays, and that "[m]aximizing density of single transistor and other memory cells is a continuing goal in semiconductor memory fabrication." (page 2, lines 7-8) Applicant's claims are written in terms of total combined area of the memory cells or total combined area of the peripheral and pitch circuitry as well as the memory cells. It would have been obvious to one skilled in the art at the time the invention was made to make 16M DRAM chips with ever increasing device density because, as applicant admits, 16M DRAM chips existed in the prior art at the time of invention and because maximizing density of single transistors and other memory cells is a continuing goal in the art.

Applicant's disclosure of the prior art fails to discuss a package having an encapsulating body and electrically conductive interconnect pins extending outwardly from the body, the specific number of cells per array, and the particular number of

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conductive layers used in the prior art. With respect to the claimed package, such packages are well known to those skilled in the art. With respect to the specific number of cells per array, this number is a function of overall device design and the use of any particular number of cells per array would have been obvious to one skilled in the art at the time of invention depending upon specific device architecture. With respect to the number of conductive lines used, one skilled in the art would have known at the time the invention was made that semiconductor devices may be fabricated with fewer than, or more than, four conductive layers, as shown by Denboer (figures 1 and 6), depending on particular device design. It would have been obvious to one skilled in the art at the time the invention was made to encapsulate the claimed memory device in a package as recited, to form the arrays with the particular number of cells as claimed, and to include less than four, or more than four, conductive line layers because all these variations are known to those skilled in the art and would have resulted from routine engineering design, optimization, and implementation considerations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Kelley whose telephone number is (703) 305-3789.

The fax phone number for this Group is (703) 308-7722.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

N. Kelley
March 14, 1997

JEROME JACKSON
PRIMARY EXAMINER
GROUP 2500